

IN THE CLAIMS:

The text of all pending claims is set forth below for the convenience of the Examiner. The status of each claim is indicated with one of (original), (currently amended), or (new).

1. (previously presented) A wavelength division multiplexing optical repeating transmission method for performing repeating transmission of a wavelength multiplexed optical signal along an optical transmission line interconnecting a terminal apparatus for transmission and a terminal apparatus for reception and having a plurality of divisional repeating intervals into which the optical transmission line is divided by a plurality of repeating apparatuses, comprising steps executed by each of said repeating apparatuses disposed at end points of the divisional repeating intervals, the steps including:

a first dispersion compensation step of compensating for a dispersion included in the wavelength multiplexed optical signal having propagated in the divisional repeating interval on the terminal apparatus side for transmission so that a remaining dispersion amount is within a tolerance set in advance;

an optical add/drop multiplexing step of performing an optical add/drop multiplexing for each of wavelength components of the wavelength multiplexed optical signal for which the dispersion compensation has been performed at the first dispersion compensation step; and

a second dispersion compensation step of performing a dispersion compensation with an additional compensation amount to the compensation amount of the first dispersion compensation step for the wavelength multiplexed optical signal for which the optical add/drop multiplexing has been performed at the optical add/drop multiplexing step, said additional compensation amount is a predetermined constant times a total dispersion amount occurred in the divisional repeating intervals on the terminal apparatus side for transmission;

the ratio of the additional compensation amount at the second dispersion compensation step to the sum of the dispersion compensation amounts at the first and second dispersion compensation steps being set so as to gradually vary together with the transmission distance from said terminal apparatus for transmission at which said repeating apparatus is disposed on said light transmission line.

2. (previously presented) The wavelength division multiplexing optical repeating transmission method as claimed in claim 1, wherein a predetermined proportion for performing the dispersion compensation process by the over compensation amount at the second dispersion compensation step is set so as to gradually increase together with the transmission distance from said terminal apparatus for transmission at which of said repeating apparatus is

disposed on said light transmission line.

3. (previously presented) The wavelength division multiplexing optical repeating transmission method as claimed in claim 1, wherein a predetermined proportion for performing the dispersion compensation process of the over compensation amount at the second dispersion compensation step is set so as to gradually decrease together with the transmission distance from said terminal apparatus for transmission at which of said repeating apparatus is disposed on said light transmission line.

4. (original) The wavelength division multiplexing optical repeating transmission method as claimed in claim 1, further comprising a residual dispersion compensation step executed by each of said repeating apparatus of compensating, where a residual dispersion appears in an optical signal of each wavelength before and after the optical add/drop multiplexing process at the optical add/drop multiplexing step, for the residual dispersion.

5. (previously presented) The wavelength division multiplexing optical repeating transmission method as claimed in claim 1, further comprising a transmission side dispersion compensation step of performing a dispersion compensation which satisfies a transmission condition for a wavelength multiplexed optical signal to be transmitted in said terminal apparatus for transmission.

6. (original) The wavelength division multiplexing optical repeating transmission method as claimed in claim 5, wherein the transmission condition relates to at least one of the kind of fiber, the transmission distance and the bit rate.

7. (previously presented) A repeating apparatus for a wavelength division multiplexing optical repeating transmission system having a terminal apparatus for transmission and a terminal apparatus for reception interconnected by an optical transmission line having a plurality of divisional repeating intervals into which the optical transmission line is divided by a plurality of repeating apparatuses to perform repeating transmission of a wavelength multiplexed optical signal, comprising:

a first dispersion compensation section compensating for a dispersion included in the wavelength multiplexed optical signal having propagated in the divisional repeating interval on the terminal apparatus side for transmission so that a remaining dispersion amount is within a

tolerance set in advance;

an optical add/drop multiplexing section performing an optical add/drop multiplexing process for each of wavelength components of the wavelength multiplexed optical signal for which the dispersion compensation has been performed in said first dispersion compensation section; and

a second dispersion compensation section performing a dispersion compensation with an additional compensation amount to the compensation amount of said first dispersion compensation section for the wavelength multiplexed optical signal for which the optical add/drop multiplexing has been performed by said optical add/drop multiplexing section, said additional compensation amount is a predetermined constant times a total dispersion amount occurred in the divisional repeating intervals on the terminal apparatus side for transmission.

8. (previously presented) The repeating apparatus as claimed in claim 7, wherein said second dispersion compensation section gradually increases a predetermined proportion for performing the dispersion compensation process by the over compensation amount together with the transmission distance from said terminal apparatus for transmission at which said repeating apparatus is disposed on said light transmission line.

9. (previously presented) The repeating apparatus as claimed in claim 7, wherein said second dispersion compensation section gradually decreases a predetermined proportion for performing the dispersion compensation process by the over compensation amount together with the transmission distance from said terminal apparatus for transmission at which of said repeating apparatus is disposed on said light transmission line.

10. (original) The repeating apparatus as claimed in claim 7, wherein at least one of said first and second dispersion compensation sections is formed from a variable dispersion compensation apparatus which can vary a set value for a dispersion compensation amount.

11. (previously presented) The repeating apparatus as claimed in claim 7, further comprising:

a dispersion slope compensation device compensating for a dispersion slope regarding a wavelength multiplexed optical signal to be inputted to said optical add/drop multiplexing section or a wavelength multiplexed optical signal outputted from said optical add/drop multiplexing section of a different one of the plural repeating apparatus.

12. (previously presented) The repeating apparatus as claimed in claim 7, further comprising:

a dispersion compensator compensating for a residual dispersion amount with respect to a dispersion compensation amount in said first or second dispersion compensation section for each optical signal of an individual channel added/dropped by said optical add/drop multiplexing section.

13. (previously presented) A wavelength division multiplexing optical repeating transmission method by repeating apparatuses disposed at end points of a plurality of divisional repeating intervals for performing repeating transmission of a wavelength multiplexed optical signal along an optical transmission line interconnecting a terminal apparatus for transmission and a terminal apparatus for reception and having the plurality of divisional repeating intervals into which the optical transmission line is divided by a plurality of repeating apparatuses, the method comprising:

performing a first dispersion compensation compensating for a dispersion included in the wavelength multiplexed optical signal having propagated in the divisional repeating interval on the terminal apparatus side for transmission so that a remaining dispersion amount is within a tolerance set in advance;

performing an optical add/drop multiplexing for each of wavelength components of the wavelength multiplexed optical signal for which the dispersion compensation has been performed at the first dispersion compensation; and

performing a second dispersion compensation using a dispersion compensation having an additional compensation amount to the compensation amount of the first dispersion compensation for the wavelength multiplexed optical signal for which the optical add/drop multiplexing has been performed,

wherein said additional compensation amount is a predetermined constant times a total dispersion amount occurred in the divisional repeating intervals on the terminal apparatus side for transmission.